

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Priority Application Serial No. 09/146,115
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 Inventor Robert Kerr et al.
 Assignee Micron Technology, Inc.
Priority Group Art Unit 2825
Priority Examiner C. Lytle
 Attorney's Docket No. MI22-1987
 Title: Methods of Contacting Lines and Methods of Forming an Electrical Contact in a
 Semiconductor Device

PRELIMINARY AMENDMENT

To: Box Patent Application
 Assistant Commissioner for Patents
 Washington, D.C. 20231

From: D. Brent Kenady (Tel. 509-624-4276; Fax 509-838-3424)
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Sir:

Please enter the following amendments prior to examining the above-identified application.

AMENDMENTS**In the Title**

Please replace the title with the following:

--METHODS OF CONTACTING LINES AND METHODS OF FORMING AN
 ELECTRICAL CONTACT IN A SEMICONDUCTOR DEVICE--

In the Specification

Please insert the following at page 1, before the "Technical Field" section:

RELATED PATENT DATA

This patent resulted from a continuation application of prior application Serial No. 09/146,115, filed on September 2, 1998, entitled "Methods of Forming Contacts, Methods of Contacting Lines, Methods of Operating Integrated Circuitry, and Integrated Circuits".

In the Claims

Please replace the claims with the following clean version of the entire set of pending claims, in accordance with 37 C.F.R. §1.121(c)(1)(i). Cancel all previous versions of any pending claim.

In the Claims

Please cancel claims 1-49.

New Claims

Add new claims 50-69 as follows:

50. (New) A method of contacting a line comprising:

providing a substrate;

forming a conductive line over the substrate;

forming at least one individual diffusion region within the substrate proximate the conductive line; and

forming conductive material in electrical contact with a portion of the conductive line and with a portion of the at least one individual diffusion region, the electrical contact with the portion of the at least one individual diffusion region comprising the only electrical contact of the conductive material with a diffusion region.

51. (New) The method of claim 50 further comprising forming an other individual diffusion region within the substrate proximate the conductive line.

52. (New) The method of claim 50 wherein the conductive line portion and the at least one individual diffusion region portion form a contact pad.

53. (New) The method of claim 50 wherein the forming of the conductive line comprises forming the conductive line to have an average lateral width dimension, and wherein the conductive line portion has a lateral width dimension which is substantially equivalent to the average lateral width dimension.

54. (New) The method of claim 50 wherein the forming of the conductive line comprises forming the conductive line to have a generally uniform lateral width dimension along its entirety.

55. (New) The method of claim 50 wherein the forming of the diffusion region defines a pn junction within the substrate, and further comprising reverse biasing the pn junction.

56. (New) The method of claim 50 wherein the forming of the diffusion region defines a pn junction within the substrate, and further comprising reverse biasing the pn junction after the forming of the conductive material.

57. (New) A method of contacting a line comprising:
providing a substrate;
forming a conductive line over the substrate, the conductive line comprising a lateral width dimension defined by opposing sidewalls;
forming a diffusion region within the substrate and directly under an entirety of the lateral width dimension of the conductive line; and
forming conductive material in electrical contact with the conductive line and the diffusion region.

58. (New) The method of claim 57 wherein the forming of the diffusion region comprises forming at least a portion of the diffusion region laterally outward of at least one sidewall of the conductive line.

59. (New) The method of claim 57 wherein the forming of the diffusion region comprises forming portions of the diffusion region laterally outward of the respective sidewalls of the conductive line.

60. (New) The method of claim 57 wherein the forming of the diffusion region comprises forming portions of the diffusion region laterally outward of the respective sidewalls of the conductive line, and wherein the forming of the conductive material comprises forming the conductive material in electrical contact with at least one of the portions of the diffusion region.

61. (New) The method of claim 57 wherein the providing of the substrate comprises providing the substrate to have a first-type dopant, and wherein the forming of the conductive line comprises forming the conductive line to have a second-type dopant which is different from the first-type dopant.

62. (New) The method of claim 61 wherein the first-type dopant comprises n-type dopant.

63. (New) The method of claim 61 wherein the first-type dopant comprises p-type dopant.

64. (New) The method of claim 57 wherein the forming of the conductive line comprises forming a first conductive layer over a second conductive layer.

65. (New) The method of claim 64 wherein the first conductive layer comprises material different from material of the second conductive layer.

66. (New) A method of forming an electrical contact in a semiconductor device comprising:

providing a substrate;

forming a conductive line over the substrate, the line comprising a first portion;

forming a single diffusion region proximate the conductive line within the substrate, the first portion and the single diffusion region forming a contact pad;

forming an insulative material over the substrate and contact pad;

forming a contact opening through the insulative material, the opening exposing at least a portion of the contact pad; and

forming conductive material over and electrically coupled to the exposed portion of the contact pad.

67. (New) The method of claim 66 wherein the forming of the contact opening comprises forming the opening to overlap with the conductive line and the single diffusion region.

68. (New) The method of claim 66 wherein the forming of the conductive line comprises forming a first conductive layer over a second conductive layer.

69. (New) The method of claim 66 wherein the forming of the conductive material comprises forming metal material electrically coupled to the exposed portion of the contact pad.


REMARKS

Applicant has canceled claims 1-49. Applicant hereby adds new claims 50-69 for full consideration by the Examiner.

The Examiner is requested to phone the undersigned if the Examiner believes such would facilitate prosecution of the present application. The undersigned is available for telephone consultation at any time during normal business hours (Pacific Time Zone).

Respectfully submitted,

Dated: 3-12-02

By: 
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